

### **Abstract of the Disclosure**

An interferometric fiber optic sensing system uses three optical fibers. A sensing optical fiber is applied to a structure to be monitored to detect displacement or the like by changing its optical path length. A reference optical fiber has a fixed optical path length. An adjustable length optical fiber is controllably adjusted in its optical path length. The three optical fibers form optical paths whose light outputs are caused to interfere. The adjustable length optical fiber is adjusted until an interference fringe appears. The quantity to be detected is derived from the maximum of the interference fringe. Several sensing optical fibers can be multiplexed; by staggering their optical path lengths, their interference fringes can be separated sufficiently to resolve them.